



Superfund Report - 01/06/2014

Region IX Short-Term Limits For TCE Exposure May Guide National Policy

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EPA Region IX is urging California state regulators to implement strict action levels and strengthened sampling strategies at certain Superfund sites in the San Francisco Bay area to protect against short-term exposures to the solvent trichloroethylene (TCE), measures that likely indicate how EPA will address TCE's short-term risks nationwide, according to an informed source.

Since late 2012, EPA officials have said agency headquarters is seeking a consistent nationwide policy for assessing and mitigating the risk of fetal cardiac malformations, a novel risk from short-term *in utero* exposures to TCE. The agency has yet to produce a document for dealing with the risk calculation for the birth defect, which first appeared in the September 2011 Integrated Risk Information System (IRIS) TCE assessment. Since then, states, EPA regional officials and industry have been struggling to account for it in cleanup plans at contaminated sites.

In a Dec. 3 letter, EPA Region IX urges the California Regional Water Quality Control Board (CRWQCB) to follow a program for assessing risks from short-term exposures to TCE that includes stringent prompt response action levels. The letter also asks the Golden State regulators to adopt sampling strategies consistent with EPA's recent draft guidance for assessing and mitigating vapor intrusion risks from chlorinated solvents. Vapor intrusion occurs when toxic vapors rise into buildings from underground contamination. *The letter is available on InsideEPA.com. (Doc ID: [2456809](#))*

In the letter, Kathleen Salyer, assistant director of the Superfund Division of Region IX's California Site Cleanup Branch, recommends mitigation measures for when prompt response action levels are exceeded. The limits and stricter sampling strategies are intended to reduce *in utero* exposures at nine sites contaminated with chlorinated solvents.

In an attachment to the Dec. 3 letter, Region IX urges California water quality regulators to adopt a prompt response action level of 9 micrograms per cubic meter (ug/m³) to protect workers at commercial and industrial facilities during an 8-hour work day, and of 7 ug/m³ for a 10-hour workday. Additionally, Region IX recommends a prompt action level of 2 ug/m³ to protect against residential exposures.

When indoor air limits are reached, the memo recommends interim measures to mitigate short-term risks. These measures include adding fans or ventilation to increase building pressurization, installing subslab and or crawlspace depressurization systems, or a soil vapor extraction system. Region IX also suggests evacuation to eliminate exposures, especially when immediate response levels are exceeded.

"In reviewing the multiple lines of evidence that have been collected for the South Bay Sites, EPA Region 9 has identified data gaps that must be filled to fully evaluate the potential for vapor intrusion into buildings overlying the South Bay Sites contamination," Salyer writes to Stephen Hill, Chief of CRWQCB's Toxics Cleanup Division.

A source familiar with the thinking of some EPA officials says the Region IX plan could prompt EPA headquarters to issue a very similar policy for assessing and mitigating risks to pregnant women from short-term exposures to TCE in the near future.

"This may force the hand of headquarters to get something out" to address risks from short-term exposures to TCE, the source says. "It's really a sign, not just for the levels, but for sampling practices, that this is a direction where EPA as a whole is heading."

In addition, the source says headquarters has not objected to Region IX's approach, and that the delay in creating a nationwide policy to protect against short-term exposures to TCE likely stems from debate over whether EPA's Office of Solid Waste and

Emergency Response (OSWER), which recently crafted draft vapor intrusion guidance, or the agency's Office of Research and Development, which includes the IRIS program that addresses chemical-specific challenges, should issue the policy.

The substance of a future national policy will likely be similar to those outlined in the recent Region IX memo and the limit Region X set to protect against short-term exposures late last year, the source says. "I haven't heard anyone at EPA questioning the general approach that Region IX or Region X have taken with setting numbers."

In response to a request for an interview or comment on the Region IX letter, an EPA spokeswoman said the agency is working with its regional officials to address vapor intrusion risks at sites contaminated with TCE and that specific action levels to protect against short-term exposures are not part of the OSWER guidance for assessing and mitigating vapor intrusion from chlorinated solvents.

Since the publication of the IRIS assessment for TCE, the Defense Department (DOD) and industry officials have criticized the science supporting the fetal cardiac risk as too uncertain for use in regulation, and said limits derived to protect against short-term exposures are based on conservative assumptions. In comments submitted on EPA's vapor intrusion guidance, DOD has urged the agency to create "defensible procedures" for setting limits to protect against short-term exposures and for responding to them at military facilities.

EPA Region IX has been a leader in efforts to protect against the birth defects risk at contaminated sites, and in early 2012 proposed a removal action level (RAL) of 15 ug/m³ to protect workers at the Middlefield-Ellis-Whisman (MEW) Superfund site in Mountain View, CA, from short-term exposures to TCE. That limit as well as the recent prompt response action levels are derived from the IRIS assessment for TCE, which set a reference concentration (RfC) -- the amount of a substance EPA believes can be inhaled daily over a lifetime without adverse effects -- of 2 ug/m³.

The RfC, which protects against chronic exposures, was based in part on a 2003 toxicology study by Paula D. Johnson that showed fetal cardiac malformations in lab rats exposed to TCE. EPA said the study indicated the birth defects could occur from inhaling the substance during pregnancy, implying risk from short-term exposure. Several peer review panels backed EPA's use of the study and the birth defects risk.

Region IX's new prompt action levels are based on a hazard quotient (HQ) of 1, though the letter states that similar levels indicating a need for an immediate response may be derived using an HQ of 3, per a 2008 OSWER policy memo for calculating RALs. The HQ represents the ratio of the exposure level to a calculated 'safe' dose.

The levels are similar to Region IX's proposed 2012 RAL for the MEW site of 15 ug/m³, using an HQ of 3. The Region IX prompt response action level is also similar to a level that Region X recommended last year of 8.4 ug/m³ in indoor air at commercial and industrial sites, and identical to Region X's limit of 2 ug/m³ to protect against exposures in homes.

But in a Dec. 13, 2012, memo, Region X described its limits as "not-to-be-exceeded concentrations, as averaged over any 21-day period of time," noting that current science is unclear on whether shorter spikes in indoor air contamination during a 21-day period cause birth defects.

Region IX limits use a different exposure duration than Region X, as the RAL assumes a single daily exposure above 15 ug/m³ for pregnant women could result in fetal cardiac defects, while the prompt response action levels are averaged over an eight or 10-hour workday.

The source says the question of exposure duration remains a challenge for EPA in part because current technology that can measure variability in indoor air levels over extended durations is not cost-effective. In the Dec. 3 memo, Region IX requires sampling practices included in OSWER's draft vapor intrusion guidance for assessing and mitigating risks from vapor intrusion that was released for public comment in April, saying the document's multiple lines of evidence approach must be followed "to fully evaluate the potential for vapor intrusion into buildings overlying" the nine contaminated sites.

Region IX requires multiple rounds of sampling from multiple locations, and also says sampling should be conducted in crawlspaces and basements. In addition, the letter calls for sampling in cold weather months when some sites contaminated with TCE in the San Francisco Bay area have been found to have contamination levels in indoor air two to three times higher than in other seasons.

A state regulator is criticizing some assessment approaches backed in the letter, saying recommendations including sampling when the air conditioning systems are not running are not technically defensible or are excessively conservative and will lead to

unnecessary precautions at some homes and buildings. The source declined to comment on the response action levels for TCE, citing scientific uncertainty surrounding that issue. -- *Dave Reynolds*

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